

## CLAIMS

1. Method for optical recognition of defects, like local deformations (41) or bubbles, in an object, especially an optical data carrier (11), in which method the object is illuminated with light by at least one source (12) and the light (15) reflected by or transmitted through the object is received by at least one light-sensitive receiver (13), in which the light is reflected by or transmitted through the object at a normal angle of reflection ( $\alpha$ ) along a normal axis of reflection (15) for a defect-free object, characterized by the fact that in front of the light-sensitive receiver, at least one property of at least one part of the light is varied when the light is reflected by or transmitted through the object along an axis of reflection (24) shifted from the normal axis of reflection and/or with an angle of reflection ( $\alpha'$ ) shifted from the normal angle of reflection.

2. Method according to Claim 1, characterized by the fact that the light incident on the light-sensitive receiver is varied in intensity and/or polarization and/or at least one wavelength or wavelength range is filtered out.

3. Device according to Claim 1 or 2, characterized by the fact that a property profile, especially an intensity profile, of the incident light is produced above the light-sensitive receiver with a gradient (45) or a local maximum or minimum when the light was reflected by or transmitted through the object (11) at the normal angle of reflection along the normal axis of reflection, in which the profile is shifted and/or changed as a function of the shift of the reflected or transmitted light relative to the light-sensitive receiver.

4. Method according to one of Claims 1 to 3, characterized by the fact that the change occurs continuously or essentially instantly as a function of the shift.

5. Method according to one of Claims 1 to 4, characterized by the fact that the intensity of the incident light is reduced when the light is reflected or transmitted at an angle of reflection shifted in one direction and/or along an axis of reflection shifted in this one direction and that the intensity of the incident light increases when the light is reflected or transmitted at an angle of reflection shifted in the other direction and/or along an axis of reflection shifted in this other direction.

6. Method according to one of Claims 1 to 4, characterized by the fact that a large part of the incident light is blocked when the light is reflected or transmitted at an angle of reflection shifted in one direction and/or along an axis of reflection shifted in this one direction and that a large part of the incident light is transmitted to the light-sensitive receiver when the light is reflected or transmitted at an angle of reflection shifted in the other direction and/or along an axis of reflection shifted in this other direction.

7. Method according to one of Claims 1 to 4, characterized by the fact that the intensity of the incident light is reduced when the light is reflected or transmitted at an angle of reflection shifted in any direction and/or an axis of reflection shifted in any direction.

8. Method according to one of Claims 1 to 4, characterized by the fact that the intensity of the incident light increases when the light is reflected or transmitted at an angle of reflection shifted in any direction or along an axis of reflection shifted in any direction.

9. Method according to one of Claims 1 to 8, characterized by the fact that the light-sensitive receiver has at least one linear, optically active sensor (19) and that the change of the incident light occurs perpendicular to the extent of the linear sensor during a shift in one direction.

10. Method according to one of Claims 1 to 9, characterized by the fact that the object is illuminated by at least one essentially parallel light beam (14).

11. Method according to one of Claims 1 to 10, characterized by the fact that the width (b1) of the light beam (14) incident on the object is larger than the optically active width (b2) of the light-sensitive sensor (19).

12. Method according to one of Claims 1 to 11, characterized by the fact that the reflected or transmitted light is focused in the objective of the light-sensitive receiver essentially independently of the angle of reflection and/or axis of reflection.

13. Method according to one of Claims 1 to 12, characterized by the fact that the change in property of the incident light occurs between focusing and the objective of the light-sensitive receiver.

14. Method according to one of Claims 1 to 13, characterized by the fact that the object is illuminated by means of a light strip and the reflected or transmitted light strip illuminates a linear, optically active sensor of the light-sensitive receiver and that during a change in at least one property of the incident light over the entire or almost the entire length

of the linear sensor of the light-sensitive receiver, the change is readjusted, especially compensated.

15. Device for optical detection of defects, like local deformations (41) or bubbles, in an object, especially an optical data carrier (11), with at least one light source that illuminates the object (11) with light and with at least one light-sensitive receiver (13) that receives the light reflected by or transmitted through the object, in which, for a defect-free data carrier the light is reflected by or transmitted through the object at a normal angle of reflection ( $\alpha$ ) or along a normal axis of reflection (15), characterized by the fact that at least one optical means (29, 32, 34, 36, 37, 39) is provided in front of the light-sensitive receiver (13), through which at least part of the light incident on the light-sensitive receiver is varied in at least one of its properties and/or intensity when the reflected or transmitted light is incident on the optical means at an angle of incidence ( $\alpha'$ ) shifted from the normal angle of incidence corresponding to the normal angle of reflection and/or along an axis of incidence (26, 27) shifted from the normal axis of incidence (28) corresponding to the normal axis of reflection.

16. Device according to Claim 15, characterized by the fact that the light-sensitive receiver has at least one linear, optically active sensor (19) and that the optical means (29, 32, 34, 36, 37, 39) causes a change in the incident light when it is shifted in a direction perpendicular to the extent of the linear sensor (19).

17. Device according to Claim 15 or 16, characterized by the fact that the optical means causes a continuous or almost instantaneous change of the incident light as a function of the shift.

18. Device according to one of Claims 15 to 17, characterized by the fact that the optical means (36, 37, 39) has a transmission profile whose transmission varies as a function of the angle of incidence and/or axis of incidence of the light on the optical means.

19. Device according to one of Claims 15 to 17, characterized by the fact that the optical means (36) has a transmission profile, which, starting from the normal angle of incidence and normal axis of incidence, decreases in one direction when the light has a shifted angle of incidence and/or axis of incidence in this direction and increases in the other direction when the light has a shifted angle of incidence and/or axis of incidence in the other direction.

20. Device according to one of Claims 15 to 17, characterized by the fact that the optical means (39, 37) has a transmission profile, which, starting from the normal angle of incidence and the normal axis of incidence, decreases or increases when the light is incident on the light sensitive receiver at a shifted angle of incidence and/or a shifted axis of incidence.

21. Device according to one of Claims 15 to 20, characterized by the fact that the optical means is designed as a mask (29), which, starting from the normal axis of incidence and the normal angle of incidence, covers one side of the light-sensitive receiver so that light with an angle of incidence and/or an axis of incidence shifted in this direction is blocked, whereas light shifted in the other direction is transmitted.

22. Device according to one of Claims 15 to 21, characterized by the fact that the optical means is designed as a color filter or polarization filter, which, starting from a normal axis of incidence and a normal angle of incidence, covers one side of the light-sensitive receiver so that a wavelength or wavelength range is filtered out or polarized for light with a shifted angle of incidence and/or axis of incidence in this direction, whereas light shifted in the other direction is transmitted or, alternatively, filtered or polarized.

23. Device according to one of Claims 14 to 22, characterized by the fact that the mask (29, 32, 34) is positioned parallel to the linear sensor (19) of the light-sensitive receiver (13).

24. Device according to one of the Claims 15 to 23, characterized by the fact that the optical means (29, 32, 34) has a property profile, especially an intensity profile, for the incident light with a gradient (45) or a local maximum or minimum over the light-sensitive receiver when the light was reflected by or transmitted through the object (11) at the normal angle of reflection along the normal axis of reflection, in which the profile is shifted and/or changed as a function of the shift of the reflected or transmitted light relative to the light-sensitive receiver based on the optical means.

25. Device according to one of Claims 15 to 24, characterized by the fact that the optical means is a slit mask (32) whose slit (33) is arranged parallel to the linear sensor (19) of the light-sensitive receiver.

26. Device according to one of Claims 15 to 25, characterized by the fact that the optical means includes a linear mask (34) whose transparent strip (35) is aligned parallel to linear optical sensor (19) of the light-sensitive receiver.

27. Device according to one of Claims 15 to 26, characterized by the fact that the optical means (36) has a darkening tinting in the direction perpendicular to the linear sensor of the light-sensitive receiver, in which the optical means extends at least partially over the objective of the light-sensitive receiver and the tinting darkens from one side to the other side of the objective.

28. Device according to one of Claims 15 to 26, characterized by the fact that the optical means (39, 37) has brightening tinting in one direction and darkening tinting in the opposite direction perpendicular to the linear sensor of the light-sensitive receiver, in which the optical means extends at least partially over the objective of the light-sensitive receiver and the line with minimum or maximum tinting is arranged above the linear sensor of the light-sensitive receiver.

29. Device according to one of Claims 15 to 28, characterized by the fact that the light is an essentially parallel light beam.

30. Device according to one of Claims 15 to 29, characterized by the fact that the width (b1) of the light beam incident on the object is larger than the optically active width (b2) of the sensor of the light-sensitive receiver.

31. Device according to one of Claims 15 to 30, characterized by the fact that an optical lens arrangement (17) is provided in front of the light-sensitive receiver, which focuses the incident light essentially independently of the angle of incidence and the axis of incidence in the objective of the light-sensitive receiver, the optical means being arranged between the optical lens arrangement and the objective to vary the properties of the incident light.

32. Device according to one of Claims 15 to 31, characterized by a telecentric structure in which the object is arranged in the parallel beam path (14, 15) of the telecentric structure.